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DEPARTMENT OF HERPETOLOGY

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BULLETIN OF THE mdhs

Volume 45 Number 3 September 2009

The Maryland Herpetological Society
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Within-pond Oviposition Site Selection in the Wood Frog (*Rana sylvatica*)

Abstract.

We examined the distribution of egg masses of Wood Frogs (*Rana sylvatica*) within a single pond on the Denison University Biological Reserve, Licking County, Ohio, USA. Water depth was the only factor that significantly differed between sites with Wood Frog egg masses and random sites without Wood Frog egg masses. There was a trend towards sites with Wood Frog egg masses having more vegetation (both submerged and emergent) than random sites.

For oviparous organisms, the selection of an oviposition site can have several consequences for the offspring (Resetarits, 1996). Several studies have shown that female amphibians can actively select the type of aquatic environment in which they deposit their eggs, thus helping to determine the larval environment of her offspring. In many cases, the presence of predators or competitors is the apparent proximate cue for oviposition site choice (e.g., Marsh and Borrell, 2001; Binckley and Resetarits, 2002; Murphy, 2003), although other factors, such as incident solar radiation and parasite risk, can also contribute (e.g., Kiesecker and Skelly, 2000; Halverson et al., 2003; Murphy, 2003).

Between-pond oviposition site selection has received more attention than within-pond oviposition site selection. However, selection of a specific oviposition site within a pond or body of water can also have important effects on offspring success or performance (e.g., Smith and Rettig, 1998; Kam et al., 1998; Rieger et al., 2004; Stevens et al., 2006).

We examined the distribution of egg masses of Wood Frogs (*Rana sylvatica*) within a single pond (Spring Peeper Pond) on the Denison University Biological Reserve (DUBR), Licking County, Ohio, USA to examine how pond characteristics might influence where egg masses are laid. In a previous study of two ponds in the DUBR (including Spring Peeper), Dougherty et al. (2005) found that Wood Frog eggs were laid nearer to shore, in shallower water, in warmer water, and at lower dissolved oxygen levels than would be expected if eggs were laid at random sites within the ponds. Here, we report on the influence of emergent and submerged vegetation cover, water depth, pH, and distance to shore on oviposition site selection by Wood Frogs, thus expanding our understanding of the characteristics affecting oviposition site selection within ponds by Wood Frogs. Such information could be used to assess the suitability of natural or artificial ponds for breeding by Wood Frogs, as well as suggest potential pond management strategies to facilitate Wood Frog breeding in ponds.

Materials and Methods.

During March and April of 2008, we surveyed Spring Peeper Pond for Wood Frog egg masses (see Schultz and Mick 1998, Smith et al. 2003a,b, Hargis et al. 2008 for details of the biology and ecology of this pond). The pond was divided into 6 m X 6 m sections. This grid was used to determine random sites for sampling. At each sampling site 7 variables were measured: distance from shore, water depth, water pH, emergent vegetation cover, submerged vegetation cover, and egg mass presence or absence. pH was measured with an Oakton Double Junction Waterproof pH Testr3+. Emergent and submerged vegetation cover was quantified at each sampling location by placing a 0.5 m X 0.5 m quadrat on the surface of the water, and recording the percent coverage of emergent and submerged vegetation. We used analyses of variance (ANOVAs) to compare characteristics of locations containing egg masses and locations containing no egg masses.

Results.

Wood Frog egg masses were found in deeper water than was found at sites without egg masses (Table 1; $F_{1,55} = 62.6, P < 0.0001$). Egg masses also tended to be slightly farther from shore than the no egg sites, but this difference only approached statistical significance (Table 1; $F_{1,55} = 3.41, P = 0.07$). Emergent vegetation coverage did not differ significantly between sites with eggs and sites without eggs, although there was a slight trend for more vegetative cover at sites with eggs (Table 1; $F_{1,55} = 2.23, P = 0.15$). Sites with eggs and sites with no eggs had similar amounts of submerged vegetation, but as with emergent vegetation, there was a trend for sites with eggs to have more vegetation (Table 1; $F_{1,55} = 2.08, P = 0.15$). Sites with and without egg masses did not differ in pH (Table 1; $F_{1,55} = 0.017, P = 0.90$).

Table 1.—Characteristics of sites within Spring Peeper Pond that had Wood Frog *(Rana sylvatica)* egg masses and random sites that did not have egg masses. Means are given ± 1 SE.

	No egg masses (N = 21)	**Egg masses (N = 36)**
Water depth (cm)	12.7 ± 2.1	33.7 ± 1.6
Distance to shore (m)	4.2 ± 0.5	5.3 ± 0.4
% Emergent vegetation cover	8.5 ± 2.2	12.6 ± 1.7
% Submerged vegetation cover	18.9 ± 2.5	23.4 ± 1.9
pH	7.89 ± 0.04	7.88 ± 0.03

Discussion.

Of the factors we measured, water depth was the only factor that significantly differed between sites with Wood Frog egg masses and random sites without Wood Frog egg masses. Our current result contrasts with Dougherty et al.'s (2005) finding that Wood Frog egg masses were found in shallower sites in 2004 than would be expected by chance. Indeed, the main aggregation of Wood Frog egg masses in 2004 was laid in the same general corner of the pond as in 2008, but was much closer to the shore (< 2-3 m) whereas in 2008 the main egg mass aggregation was much further from the shore (7 – 10 m) (G.R. Smith, pers. observ.). It thus appears the choice of oviposition site within ponds can vary from year-to-year (see also Seale, 1982). Other studies have found water depth to be important for within pond oviposition site selection in Wood Frogs, however, the actual preferred depth seems to differ among studies (e.g., intermediate depths used, Seale 1982; shallower water than the maximum available used, Egan and Paton, 2004).

There was also a trend towards sites with Wood Frog egg masses having more vegetation (both submerged and emergent) than random sites. Previous studies have noted the importance of vegetation in oviposition site choice in Wood Frogs. Skidds et al. (2007) found that Wood Frogs laid more egg masses in ponds with more non-woody plant cover, as did Egan and Paton (2004). Haynes and Aird (1981) and Seale (1982) found that Wood Frog egg masses were frequently associated with vegetation.

Acknowledgments.

This study was done under a permit from the Ohio Division of Wildlife, and was approved by the Denison University IACUC.

Literature Cited.

Binckley, C.A. and W.J. Resetarits, Jr.
2002. Reproductive decisions under threat of predation: Squirrel treefrog (*Hyla squirella*) responses to banded sunfish (*Enneacanthus obesus*). Oecologia 130: 157-161.

Dougherty, C.K., D.A. Vaala, and G.R. Smith.
2005. Within-pond oviposition site selection in two spring-breeding amphibians (*Ambystoma maculatum* and *Rana sylvatica*). J. Freshwater Ecol. 20: 781-782.

Egan, R. S. and P.W.C. Paton.
2004. Within-pond parameters affecting oviposition site by Wood Frogs and Spotted Salamanders. Wetlands 24: 1-13.

Halverson, M.A., D.K. Skelly, J.M. Kiesecker, and L.K. Freidenburg.
2003. Forest mediated light regime linked to amphibian distribution and performance. Oecologia 134: 360-364.

Hargis, S.E., M.-K. Harr, C.J. Henderson, W.J. Kim, and G.R. Smith.
2008. Factors influencing the distribution of overwintered bullfrog tadpoles (*Rana catesbeiana*) in two small ponds. Bull. Maryland Herpetol. Soc. 44: 39-41.

Haynes, C.M. and S.D. Aird.
1981. The distribution and habitat requirements of the wood frog (Ranidae: *Rana sylvatica* Le Conte) in Colorado. Special Report, Colorado Div. Wildl. 50: 1-29.

Kam, Y.-C., C.-F. Yen, and C.-L. Hsu.
1998. Water balance, growth, development, and survival of arboreal frog eggs (*Chirixalus eiffingeri*, Rhacophoridae): Importance of egg distribution in bamboo stumps. Physiol. Zool. 71: 534-540.

Kiesecker, J.M. and D.K. Skelly.
2000. Choice of oviposition site by gray treefrogs: The role of potential parasitic infection. Ecology 81: 2939-2943.

Marsh, D.M. and B.J. Borrell.
2001. Flexible oviposition strategies in túngara frogs and their implications for tadpole spatial distributions. Oikos 93: 101-109.

Murphy, P. J.
2003. Does reproductive choice in a neotropical frog mirror variable risks facing offspring? Ecol. Monogr. 79: 45-67.

Resetarits, W.J. Jr.
1996. Oviposition site choice and life history evolution. Am. Zool. 36: 205-215. Rieger,

J. F., C.A. Binckley, and W.J. Resetarits Jr.
2004. Larval performance and oviposition site preference along a predation gradient. Ecology 85: 2094-2099.

Schultz, T.D. and J.R. Mick.
1998. A survey of amphibian species richness and breeding habitats at the Denison University Biological Reserve (Licking County, Ohio). Ohio Biol. Survey Notes 1: 31-38.

Seale, D.B.
1982. Physical factors influencing oviposition by the woodfrog, *Rana sylvatica*, in Pennsylvania. Copeia 1982: 627-635.

Skidds, D.E., F.C. Golet, P.W.C. Paton, and J.W.C. Mitchell.
2007. Habitat correlates of reproductive effort in wood frogs and spotted salamanders in an urbanizing watershed. J. Herpetol. 41: 439-450.

Smith, G.R., H.A. Dingfelder, and D.A. Vaala.
2003a. Distribution and abundance of amphibian larvae within two temporary ponds in central Ohio, USA. J. Freshwater Ecol. 18: 491-496.

Smith, G.R. and J.E. Rettig.
1998. Observations on egg masses of the American toad (*Bufo americanus*). Herpetol. Nat. Hist. 6: 61-64.

Smith, G.R., D.A. Vaala, and H.A. Dingfelder.
2003b. Distribution and abundance of macroinvertebrates within two temporary ponds. Hydrobiologia 497: 161-167.

Stevens, C.E., C.A. Paszkowski, and G.J. Scrimgeour.
2006. Older is better: Beaver ponds on boreal streams as breeding habitat for the wood frog. J. Wildl. Manage. 70: 1360-1371.

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An illustrated key to the shed skins of the snakes of Maryland

Brian S. Gray

Abstract

A simplified and compact key for the field identification of shed skins of Maryland snake species is provided. Illustrations of important distinguishing characters are included, and aid the user in correct identifications.

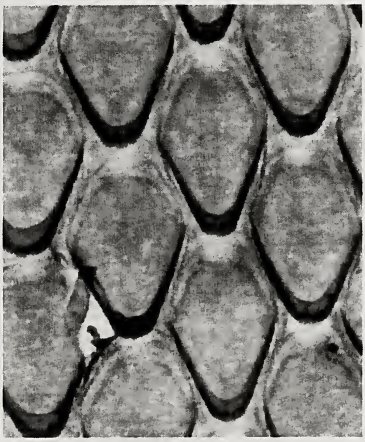
Introduction.

Although my previously published key to shed snake skins (Gray 2005) can be used to identify sheds found in Maryland, it encompass a larger geographic area, and therefore contains several species not found in Maryland. By restricting the present key to Maryland snakes, I have been able to present a more simplified, and thus easier to use key. A further advantage is that the key's smaller dimensions allow it to be more easily taken into the field. To aid in the identification of shed skins in the field, I have also designed the key so that the only additional tools required are scissors and a hand lens. For instructions on how to cut a shed for examination see my earlier publications (Gray 2002; Gray 2005). I should mention that the condition that a shed skin is found may prevent field identification, and require taking it home for proper spreading and mounting. It should also be noted that in rare instances, shed skins from anomalous individuals may key out incorrectly. If you suspect you have an anomalous shed, I would recommend using the key and species accounts in Gray (2005). For three species, *Agkistrodon contortrix*, *Diadophis punctatus*, and *Lampropeltis triangulum,* identifications to the subspecific level has not been done due to the difficulty in distinguishing between intergrades using shed skins. The inclusion of the Northern Pine Snake, *Pituophis melanoleucus melanoleucus* in this key in no way sanctions the idea that this species is native to the state; only that there is a possibility of introduced or escaped captive snakes present within the state. For a review of the evidence and justification for rejecting the Northern Pine Snake as a native member of the herpetofauna of Maryland see Ashton et al (2007), Harris (2007a; 2007b), and Kimmich (2007). Any suspected sheds of *P. m. melanoleucus* should be taken or sent to a qualified herpetologist for proper identification. Common and scientific names follow those listed in Collins and Taggart (2009).

Key to the shed skins of the snakes of Maryland

1a. Dorsal scales smooth (figure 1)...**go to 2**

b. Dorsal scales keeled (figure 2)...**go to 11**



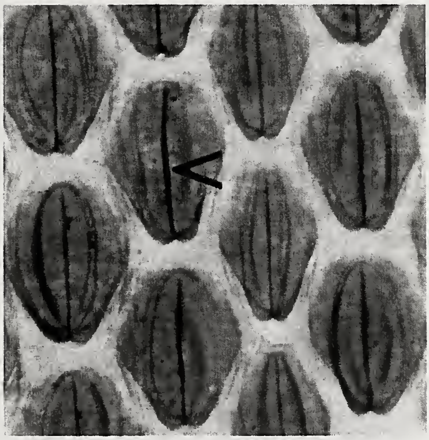


Figure 1 (left). Smooth scales lack keels. **Figure 2 (right).** Keeled scales; arrow indicates keel.

2a. Dorsal scale rows (DSR) 15 or fewer (figure 3)...go to 3

b. DSR 17 or more...go to 6.

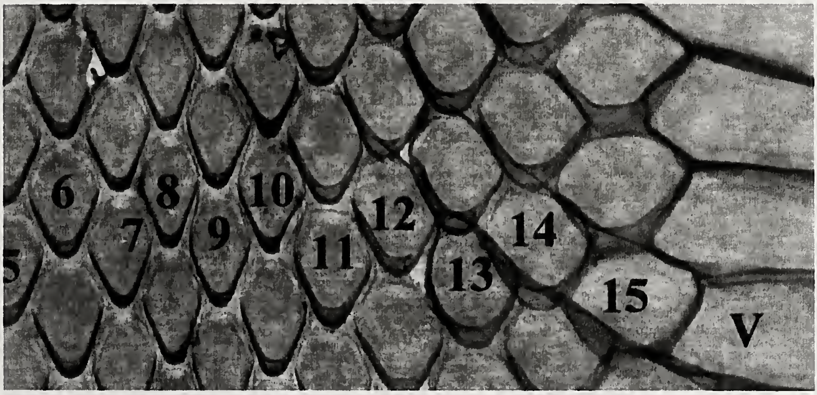
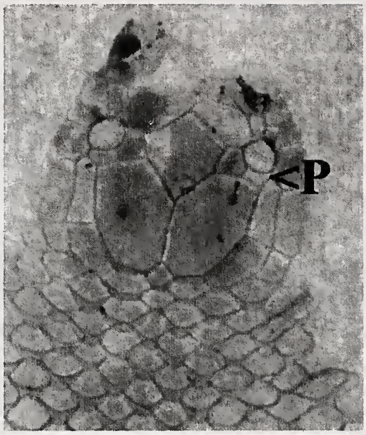


Figure 3. Method of counting dorsal scale rows; V indicates ventral scales.

3a. DSR 13, single post ocular scale (figure 4)...Eastern Worm Snake, *Carphophis amoenus amoenus*.

b. DSR 15, two or more post ocular scales...go to 4.



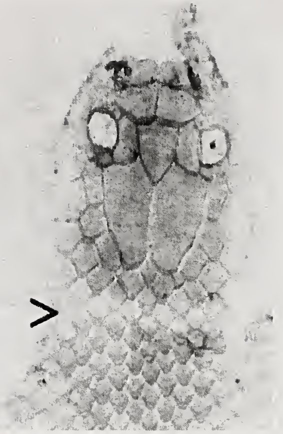


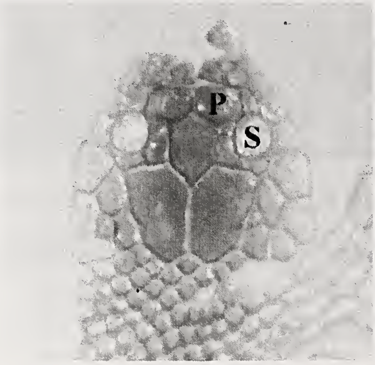
Figure 4 (left). Arrow pointing to single post ocular scale (P), *Carphophis amoenus*. **Figure 5 (right).** Arrow indicates collar on shed skin of *Diadophis punctatus*.

4a. an un-pigmented collar on the neck section of shed skin (figure 5)...Ringneck Snake, *Diadophis punctatus*

b. no such collar...go to 5.

5a. Prefrontal scale contacts spectacle (figure 6)...Eastern Earth Snake, *Virginia valeriae valeriae*

b. Prefrontal scale does not contact spectacle (figure 7)...Smooth Green Snake, *Liochlorophis vernalis*.



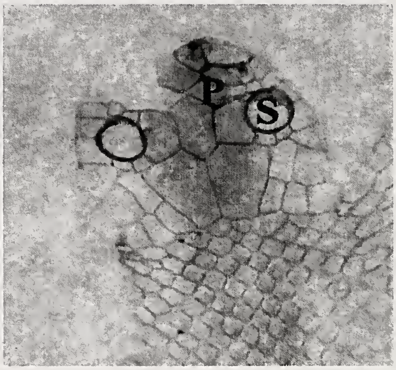
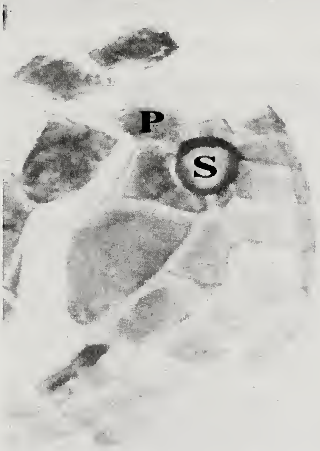


Figure 6 (left). Prefrontal scales (P) contact spectacle (S), *Virginia* **sp. Figure 7 (right). Prefrontal scales (P) do not contact spectacle (S),** *Liochlorophis vernalis*.

6a. prefrontal scale contacts spectacle (figure 8), DSR 19...Rainbow Snake, *Farancia erytrogramma erytrogramma*.

b. prefrontal scale does not contact spectacle (figure 9)...**go to 7.**



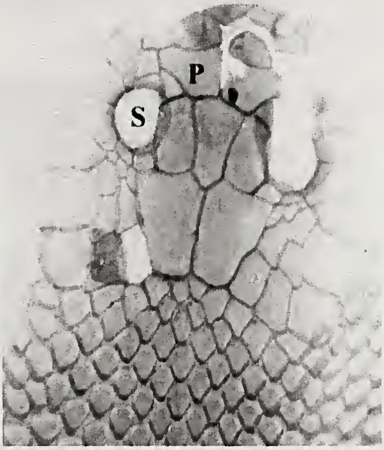


Figure 8 (left). Prefrontal scale (P) contacts spectacle (S) in ***Farancia.*** **Figure 9 (right).** Prefrontal scale does not contact spectacle.

7a. DSR 17; pigmentation on shed relatively uniform…**Northern Black Racer**, *Coluber constrictor constrictor*

b. DSR 19 or more, pigmentation not uniform…**go to 8**.

8a. shed has a chain-like pattern (figure 10)…**Eastern Kingsnake**, *Lampropeltis getula getula.*

b. pattern not as above…**go to 9** .

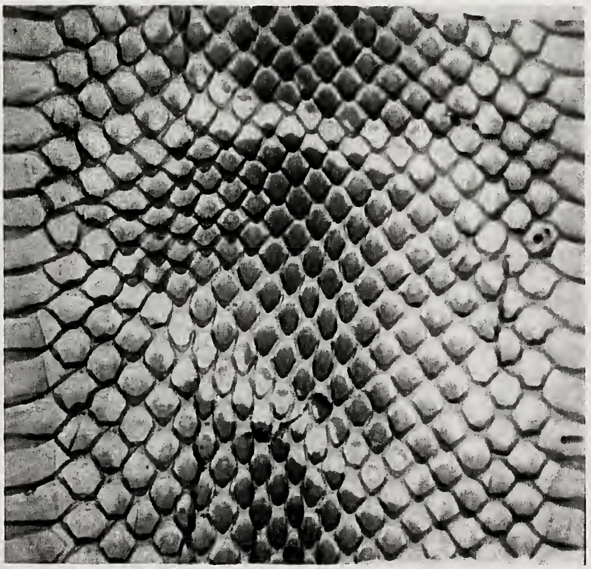
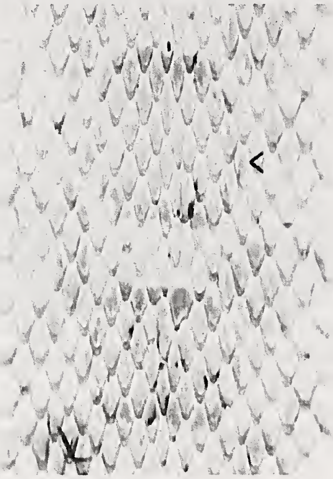


Figure 10. Chain-like pattern on shed skin of ***Lampropeltis getula.***

9a. dorsal blotches are completely enclosed with dark pigment (figure 11), temporal scales 2+2 or 2+3...**go to 10.**

b. dorsal blotches open on lower sides, dark pigment on anterior and posterior sides only, temporal scales 1+2... **Northern Scarlet Snake,** *Cemophora coccinea copei.*



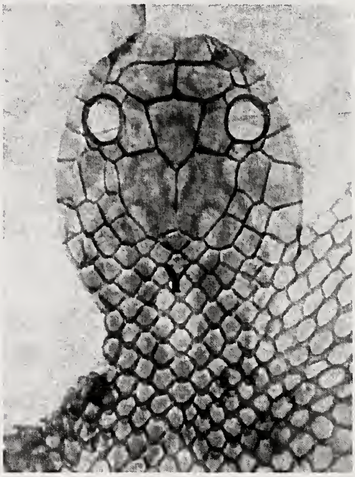
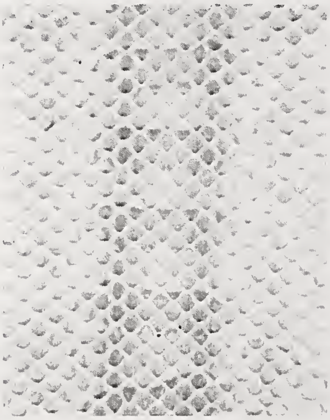


Figure 11 (left). Dorsal blotches enclosed by dark pigment, arrow indicates that sides are enclosed with dark pigment. Figure 12 (right). A dark bordered Y indicated by "Y" on head/neck of ***Lampropeltis triangulum.***

10a. dorsal blotches extend to beyond DSR 5, a dark-bordered Y or U on head/neck of shed (figure 12)...**Milk Snake,** *Lampropeltis triangulum*

b. dorsal blotches rarely extend below DSR 5 (figure 13.), Y or U if present not distinct (14.)...**Mole Kingsnake,** *Lampropeltis calligaster rhombomaculata.*



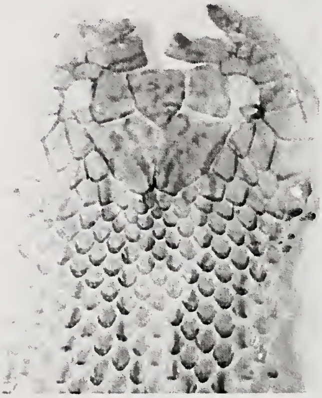
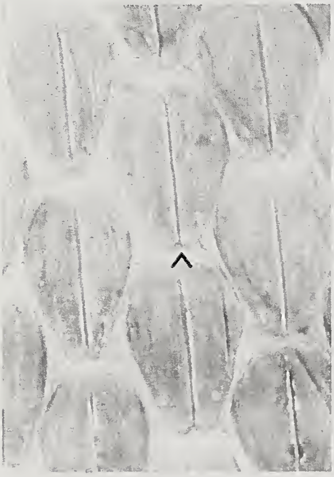


Figure 13 (left). Pattern of ***Lampropeltis calligaster.*** **Figure 14 (right). Head and neck section of** ***Lampropeltis calligaster*** **shed, note** indistinct "Y".

11a. posterior apex of dorsal scales are notched (figure 15)...**go to 12**

b. posterior apex of dorsal scales with out a notch (figure 16)...**go to 18**



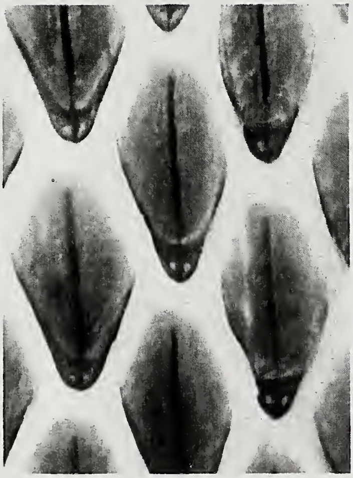


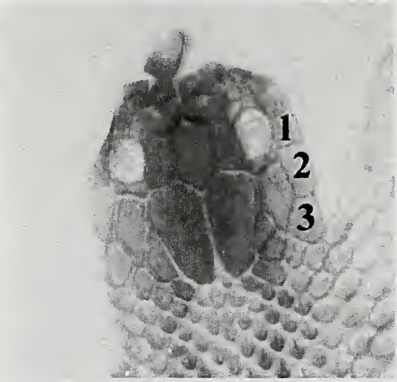
Figure 15 (left). Keeled scales with an apical notch (arrow). **Figure 16 (right). Keeled scales without an apical notch.**

12a. DSR 19 or fewer...**go to 13**

b. DSR 21 or more...**go to 17**

13a. DSR 15, three posterior supralabials (PSL) (figure 17)...**Northern Redbelly Snake**, *Storeria occipitomaculata occipitomaculata*

b. DSR 17 or more, PSL 4 (figure 18.)...**go to 14**



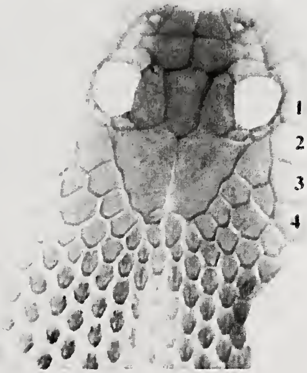
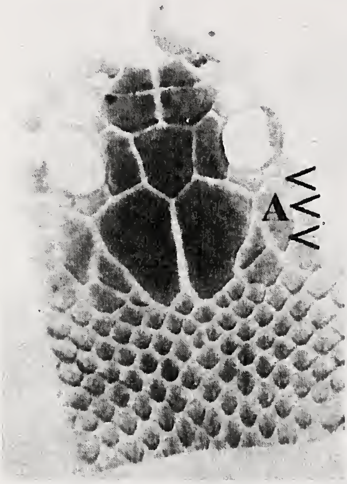


Figure 17 (left). Posterior supralabials numbered 1-3 in *Storeria occipitomaculata occipitomaculata*. **Figure 18 (right)**. Posterior supralabials numbered 1-4 in *Thamnophis sirtalis sirtalis*.

14a. DSR 17, last three PSL contact anterior temporal scale (figure 19)...**Northern Brown Snake**, *S. dekayi dekayi*.

b. DSR 19, only two PSL contact anterior temporal (figure 20)...**go to 15**



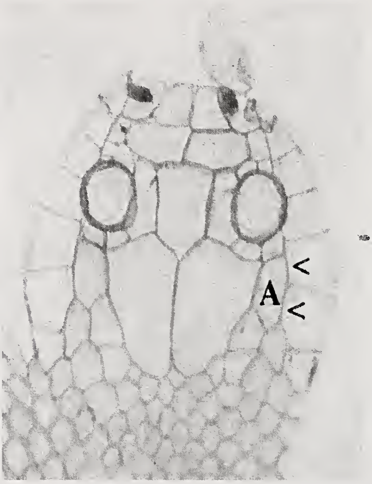
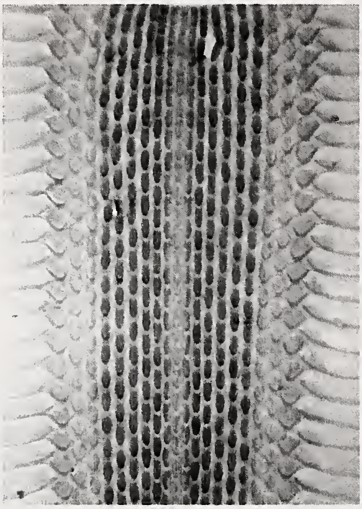


Figure 19 (left). Arrows indicating that three posterior supralabials contact anterior temporal scale (A), as in *Storeria dekayi dekayi.* **Figure 20 (right).** Arrows indicate that only two posterior supralabials contact anterior temporal (A), as in *Regina septemvittata.*

15a. light vertebral and or lateral stripes present, if no vertebral stripe, check for alternating dark blotches above lateral stripes (figure 21)...**go to 16.**

b. pattern not as above, scales on DSR 1 and 2 lack pigment, and those above uniformly pigmented (figure 22)...**Queen Snake**, *Regina septemvittata.*



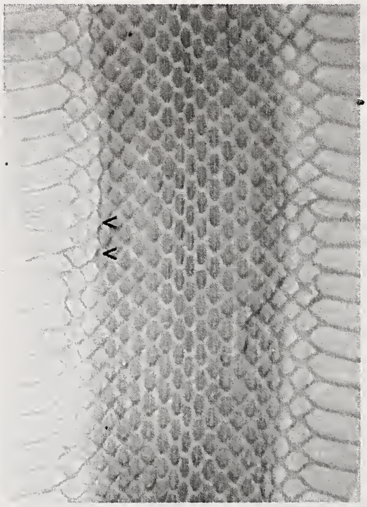
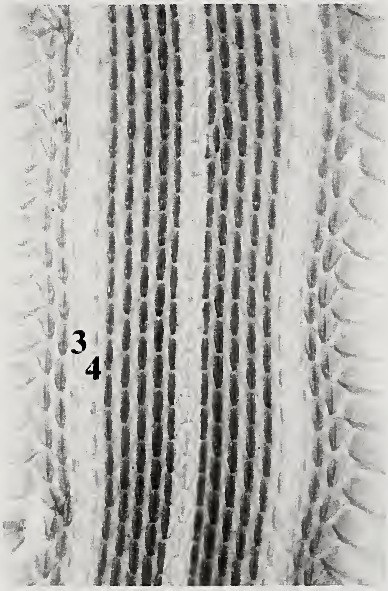


Figure 21. **(left).** Lateral and vertebral stripe on shed skin of *Thamnophis sirtalis sirtalis.* **Figure 22**. **(right).** Dorsal scale rows 1 and 2, indicated by arrows, lack pigment, *Regina septemvittata.*

16a. vivid striped pattern, vertebral stripe contacts parietal scales, lateral stripes on DSR 3 and 4 (figure 23)...**Eastern Ribbon Snake**, *Thamnophis sauritus sauritus*

b. striped pattern may be indistinct, vertebral stripe does not contact parietals, lateral stripes on DSR 2 and 3 (figure 24)…**Eastern Garter Snake**, *T. sirtalis sirtalis*



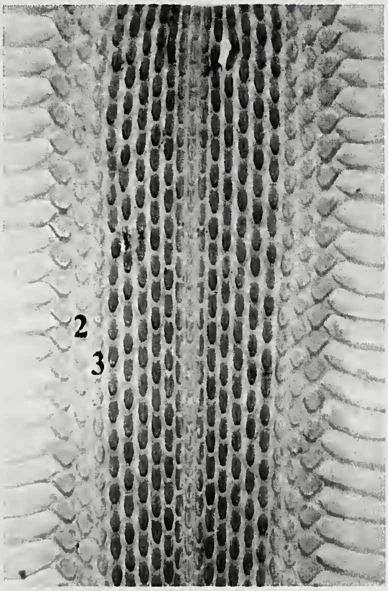
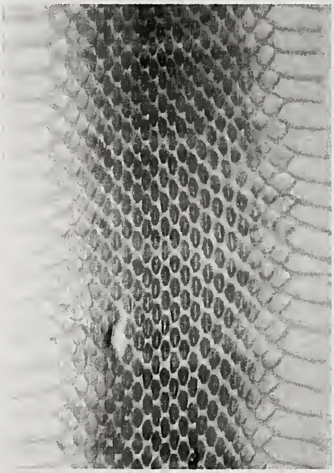


Figure 23 (left). Lateral stripes on DSR 3 and 4, *Thamnophis sauritus*. **Figure 24 (right).** Lateral stripes on DSR 2 and 3, *Thamnophis sirtalis*.

17a. banded or blotched pattern distinct (figure 25)...**Northern Water Snake**, *Nerodia sipedon sipedon*.

b. pattern not distinct, pigmentation on shed appears uniform (figure 26)…**Redbelly Water Snake**, *N. erythrogaster erythrogaster*.



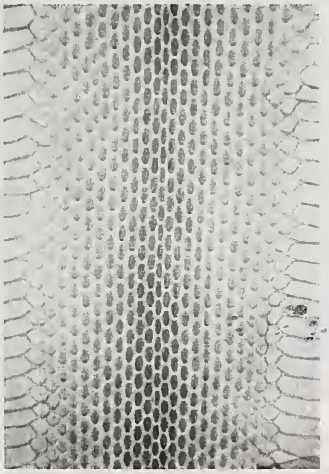


Figure 25 (left). Pattern on *Nerodia sipedon* shed. **Figure 26 (right).** Indistinct pattern on *Nerodia erythrogaster* shed.

18a. DSR 17...**go to 19.**

b. DSR 21 or more...**go to 20**

19a. prefrontal scale contacts spectacle (figure 6.)...**Mountain Earth Snake**, *V. pulchra.*

b. prefrontal does not contact spectacle (figure 7.)...**Rough Green Snake**, *Opheodrys aestivus.*

20a. shed skin has a blotched pattern...**go to 21.**

b. shed skin not blotched, pattern uniform or banded...**go to 23.**

21a. solid dark square blotches, with smaller alternating blotches on the sides (figure 27)...**Eastern Hognose Snake**, *Heterodon platirhinos.*

b. blotched pattern not as above...**go to 22**

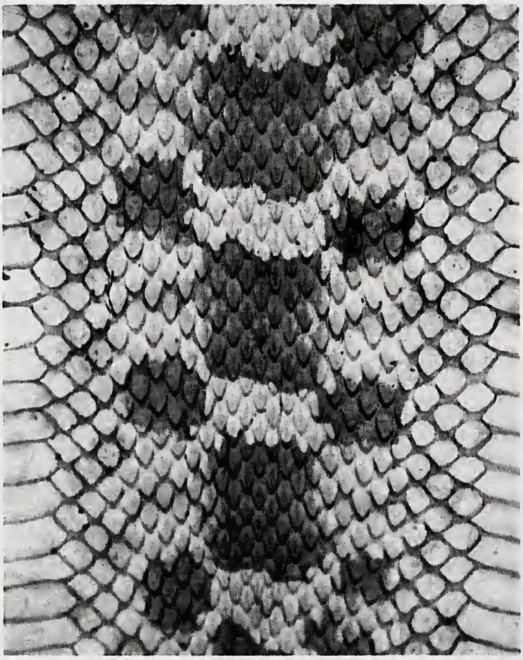
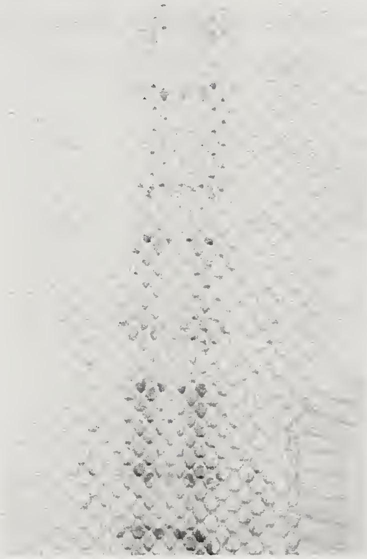


Figure 27. Pattern of *Heterodon platirhinos.*

22a. blotches dark bordered squares, may appear ladder-like (figure 28); two prefrontal Scales...**Eastern Corn Snake**, *Pantherophis guttatus.*

b. blotches large and uniform, not ladder-like (figure 29); four prefrontal scales...**Northern Pine Snake**, *Pituophis melanoleucus melanoleucus.*



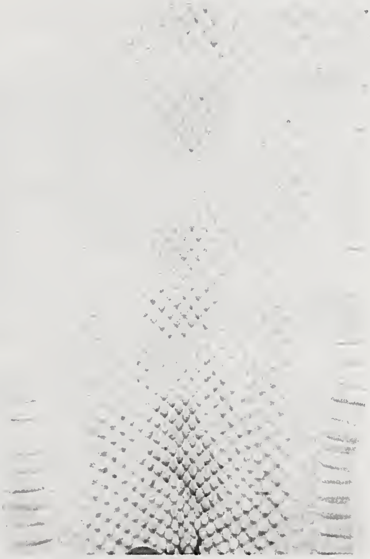
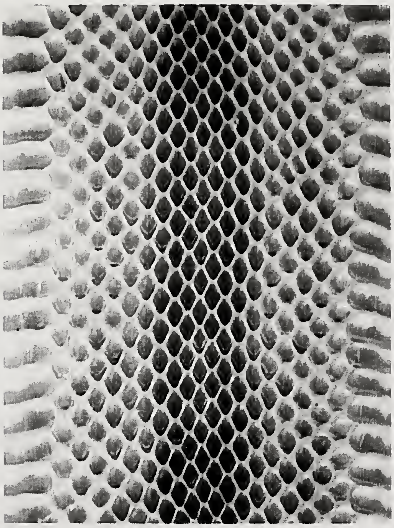


Figure 28 (left). Ladder-like pattern of *Pantherophis guttatus*. **Figure 29 (right)**. Pattern of *Pituophis m. melanoleucus*.

23a. shed skin is darkly pigmented, darkest medially, pigment extends onto ventral scales. (figure 30)...**Eastern Rat Snake**, *Scotophis alleghaniensis*.

b. pattern on shed not as above...**go to 24.**



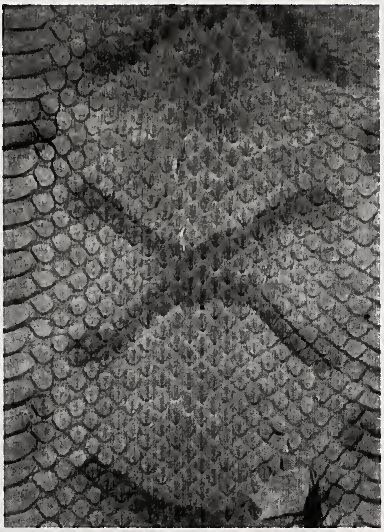


Figure 30 (left). Darkly pigmented pattern of *Scotophis alleghaniensis*. **Figure 31 (right)**. Hour glass pattern of *Agkistrodon contortrix*.

24a. pattern consists of "hour glass" cross-bands (figure 31) ...**Copperhead**, *Agkistrodon contortrix*.

b. pattern consists of chevron-shaped cross-bands (figure 32)...**Timber Rattlesnake**, *Crotalus horridus*.

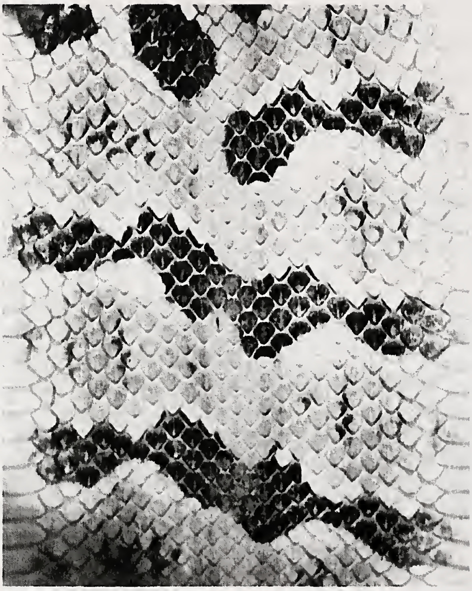


Figure 32. Chevron-shaped pattern of *Crotalus horridus*.

Literature Cited.

Ashton, R., R. Chance, R. Franz, J. D. Groves, J. D. Hardy, Jr., H. S. Harris, Jr., W. Hays, W. Hildebrand, D. S. Lee, W. S. Sipple, R. Stanley, and R. G. Tuck, Jr.

2007. Delusions of science: Concerns regarding the unwarranted introduction of Pine Snakes to the Delmarva Peninsula of Maryland. Bull. Maryland Herp. Soc. 43(4):147-158.

Collins, J. T. and T. W. Taggart.

2009. Standard Common and Current Scientific Names for North American Amphibians, Turtles, Reptiles, and Crocodilians. Sixth edition. Publication of The Center for North American Herpetology, Lawrence. iv+ 44 pp.

Gray, B. S.

2002. A Key to the shed skins of Northeastern snakes. Bull. Chicago Herp. Soc. 37(7):121-128.

Gray, B. S.

2005. The serpent's cast: A guide to the Identification of shed skins from snakes of the Northeast and Mid-Atlantic States. The Center for North American Herpetology Monograph Series no. 1. Serpent's Tale Natural History Book Distributors, Lanesboro, Minnesota. 88 pp.

Harris, H. S., Jr.
2007a. The father of Delmarva herpetology. Bull. Maryland Herp. Soc. 43(1):4-7.

Harris, H. S., Jr.
2007b. Antics in the name of science. Bull. Maryland Herp. Soc. 43(4):159-161.

Kimmich, B.
2007. RE: What price for biodiversity. Bull. Maryland Herp. Soc. 43(1):35-37.

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Notes on Reproduction of the Introduced Madagascar Day Gecko, *Phelsuma grandis* (Squamata: Gekkonidae) in Hawaii

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Abstract.

The reproductive cycle of the introduced gecko, *Phelsuma grandis* was studied from a histological analysis of museum specimens from Oahu, Hawaii. Males exhibited a continuous period of spermiogenesis (sperm formation) during the ten months sampled. The smallest reproductively active male measured 85 mm SVL. Females produced clutches that contained two eggs. The presence of oviductal eggs and concomitant yolk deposition in the same females indicates *P. grandis* produces multiple egg clutches in Hawaii. The smallest reproductively active female measured 90 mm SVL.

Introduction.

The Madagascar day gecko, *Phelsuma grandis* (formerly *P. madagascariensis grandis*) is native to Madagascar being found along the northern extreme of the island (Raxworthy et al., 2007). It was first reported in Hawaii on the island of Oahu by Kraus (2002), and was subsequently found in Florida (Krysko et al., 2003). The purpose of this note is to give information on the reproduction of an introduced population of *P. grandis* from Oahu, Hawaii from a histological analysis of museum specimens. The first report on the testicular cycle of *P. grandis* is presented. Information on reproductive potential of introduced species is needed for assessing their potential growth rates and these data are useful in determining how such species impact native fauna and flora.

Materials and Methods.

A total of 47 *P. grandis* was collected from 2003-2008 in Manoa Valley, Honolulu, Oahu, Hawaii (21.3106°N, 157.8628°W) and are preserved in the herpetology collection of the Bernice P. Bishop museum (BPBM), Honolulu, Hawaii. The sample consisted of 27 males (mean Snout-vent length, SVL = 105.3 mm ± 11.5 SD, range = 67-118 mm) and 20 females (mean SVL = 96.6 mm ± 8.6 SD, range = 85-118 mm). Geckos examined were: BPBM 14089, 14092, 14756, 18226,18227, 20990, 20999, 21000, 21140, 21142, 21143, 21151, 23521, 23597, 23601, 23602, 23975, 24106-24108, 24110, 24217, 24711, 24712, 24718, 25360, 25589, 28353-28355, 28361 28655-28659, 28665, 28667, 31551, 31594-31596, 31598-31602 .

The left testis was removed from males and the left ovary from females for histological examination. Tissues were embedded in paraffin and cut into sections at 5 μm. Slides were stained with Harris' hematoxylin followed by eosin counterstain (Presnell and Schreibman, 1997). Slides of testes were examined to determine the stage of the male cycle; slides of ovaries were examined for the presence of yolk deposition or corpora lutea. Enlarged ovarian follicles (> 4 mm length) or oviductal eggs were counted but not sectioned. Histology slides are deposited in BPBM. An unpaired *t*-test was used to compare male and female mean body sizes (Instat vers. 3.0b, Graphpad Software, San Diego, CA).

Results.

The mean body size of males (SVL) was significantly larger than that of females (unpaired *t*-test = 2.9, *df* = 45, *P* = 0.007). The two stages recorded in the testicular cycle were spermiogenesis

(= sperm formation) and regression. In spermiogenesis, the seminiferous tubules are producing sperm. Lumina of the seminiferous tubules are lined by sperm clusters and groups of metamorphosing spermatids are present. Males undergoing spermiogenesis were recorded from the following months: (January, *n* = 4; March, *n* = 2; April, *n* = 2; May, *n* = 4; June, *n* = 4; July, *n* = 2; September, *n* = 3; October, *n* = 3; November, *n* = 1; December, *n* = 1.The smallest reproductively active male (spermiogenesis) measured 85 mm SVL (BPBM 28665) and was from July. One additional subadult male that measured 67 mm SVL (BPBM 24107) from June contained a regressed testis in which Sertoli cells and spermatogonia predominated.

Monthly changes in the ovarian cycle are in Table 1. Five stages were observed; (1) Quiescent: no yolk deposition in progress; (2) Early yolk deposition: basophilic yolk granules are present; (3) Enlarged follicles: yolk deposition is progressing and the ovarian follicles have enlarged; (4) Oviductal eggs: ovulation has occurred, eggs are in oviduct awaiting oviposition; (5) Oviductal eggs and yolk deposition: eggs in oviduct with concomitant yolk deposition in ovarian follicles for next clutch. This is evidence that in Hawaii, *P. grandis* females may produce multiple clutches during the same reproductive season. Females exhibited reproductive activity during December to June. Sample sizes from August and September are too small to exclude possible reproductive activity during these months and samples were lacking from October and November. The mean clutch size for ten gravid females was 2.0. The smallest reproductively active female (2 oviductal eggs) measured 90 mm SVL (BPBM 24718) and was from April.

Table 1. Monthly stages in the ovarian cycle of 20 *Phelsuma grandis* from Oahu, Hawaii.

Month	***n***	**Quiescent**	**Early yolk deposition**	**Enlarged follicles > 4mm**	**Oviductal eggs**	**Oviductal eggs and yolk deposition**
January	1	0	1	0	0	0
February	1	0	0	0	0	1
March	1	0	0	0	1	0
April	2	0	0	0	0	2
May	1	0	0	1	0	0
June	7	1	0	2	2	2
August	1	1	0	0	0	0
September	4	4	0	0	0	0
December	2	1	0	0	1	0

Discussion.

Phelsuma grandis produces multiple clutches of two eggs which is standard for geckoes (Vitt, 1986) and similar to the clutches of one and two reported in its native range (Henkel and Schmidt, 2000). In captivity *P. madagascariensis* produced clutches of two eggs every 25 to 30 days (Bruse et al., 2005) or every 28-42 days (Henkel and Schmidt, 2000). There apparently, is a lack of reproductive data for *P. grandis* from natural populations, thus most information comes from captive animals in which breeding occurs from November to April-May (Henkel and Schmidt, 2000). Data from Hawaiian *P. grandis* indicates a potential for year-round reproduction. Kluge

(1967) categorized gecko reproductive cycles as: (1) no definite seasonal reproductive cycle and mating may occur throughout the year, and (2) breeding is cyclic and restricted to a short period during the year. *Phelsuma grandis* clearly fits into the former category.

Acknowledgment.

We thank K. Kishinami (BPBM) for permission to examine specimens.

Literature Cited.

Bruse, F., M. Meyer, and W. Schmidt.
2005. Professional Breeders Series Day Geckos. Edition Chimaira, Frankfurt am Main, Germany, 175 pp.

Henkel, F.W. and W. Schmidt.
2000. Amphibians and Reptiles of Madagascar and the Mascarene, Seychelles, and Comoro Islands. Krieger Publishing Company, Malabar, Florida. 316 pp.

Kluge, A.G.
1967. Higher taxonomic categories of gekkonid lizards and their evolution. Bulletin American Museum of Natural History 135:1-59.

Kraus, F.
2002. New records of alien reptiles in Hawai'i. Bishop Museum Occasional Papers, Records of the Hawaii Biological Survey for 2000, Part 2: Notes 69:48-52.

Krysko, K.L., A. Nichole Hooper, and C.M. Sheehy III.
2003. The Madagascar giant day gecko, *Phelsuma madagascariensis grandis* Gray 1870 (Sauria: Gekkonidae): a new established species in Florida. Florida Scientist. 66:222-225.

Presnell, J.K., and M.P. Schreibman.
1997. Humason's Animal Tissue Techniques. 5th Ed., The Johns Hopkins University Press, Baltimore, xix + 572 pp.

Raxworthy, C.J., C. M. Ingram, N. Rabibisoa, and R.G. Pearson.
2007. Applications of ecological niche modeling for species delimitation: a review and empirical evaluation using day geckos (*Phelsuma*) from Madagascar. Systematic Biology 56:907-923.

Vitt, L.J.
1986. Reproductive tactics of sympatric gekkonid lizards with a comment on the evolutionary and ecological consequences of invariant clutch size. Copeia 1986:773-786.

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Range Extension of the King Snake *Lampropeltis Mexicana* (Serpentes: Colubridae) to Tepotzotlan, State of Mexico.

The herpetofauna of the State of Mexico has been poorly studied. Records from 1946 through 2006 (Smith and Taylor 1945, Dixon et al., 1962, Smith and Smith 1976, Smith and Smith 1977, Camarilo 1981, Lara-Góngora 1983 , Lemos- Espinal and Rodriguez 1984, Ramirez et al., 1991, Camarillo and Aguilar 1992, Camarillo and Smith 1992, Flores-Villela and Sherry 1994, Manjarrez 1994, Manjarrez et al., 1995, and Casas-Andreu Pineda 1997, Valdespino 1998, Zarate 2002, Keer 2003, Altamirano et al. 2006, 2007, Castillo and Reyes 2006) failed to document the occurrence of *Lampropeltis mexicana* in the State of Mexico.

A male specimen of *Lampropeltis mexicana* measuring 290 mm snout-vent length , and 55.1 mm tail length and a corporal weight of 18 g, was found on 3 October 2006 on the slope shrubby in Tepotzotlán, State of Mexico (Figure 1). It was captured at the coordinates 19°45'58"N, and 99°19'21" W, at an elevation of 1448 meters. The vegetation here consists of oak forest with shrubby as secondary vegetation. Pasture and grazing have been introduced (INEGI, 1996; Figure 2). The snake (LM207) is preserved in 10% formalin, and has been deposited in the herpetological laboratory of F.E.S, Iztacala, U.N.A.M. This specimen was killed by the locals.

L. mexicana is known from the Mexican states of Coahuila, Durango, Nuevo Leon, San Luis Potosi, Tamaulipas, Veracruz and Guanajuato (Smith and Smith 1976), Sierra de Santa Rosa, Guanajuato (Mendoza-Quijano et al., 2001), Zacatecas, and Aguas Calientes (Quintero-Dias et al., 2001), 9.6 km to the west-northwest of the cart Jalpan Querétaro (Campbell and Lamar, 2004). Bryson et al (2007), mentions the following: north of Dr. Arroyo and near Iturbide in Nuevo Leon, Valle de los Fantasmas in San Luis Potosi, in Asientos nearby Aguascalientes, Hwy 40 west of Cd. Durango and Rancho Santa Barbara in Durango.

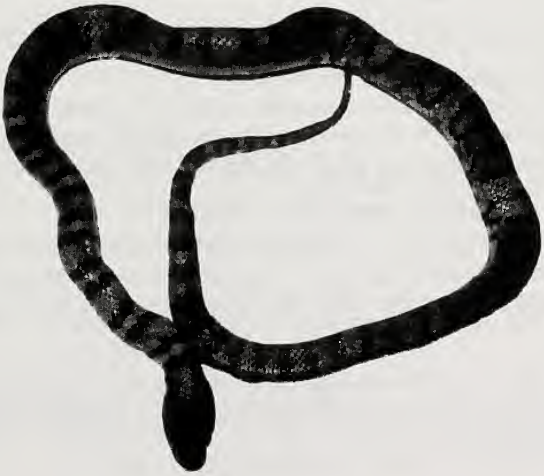

Figure 1. *Lampropeltis mexicana* found in Tepotzotlan

Keywords: Tepotzotlan, Distribution, *Lampropeltis mexicana*.

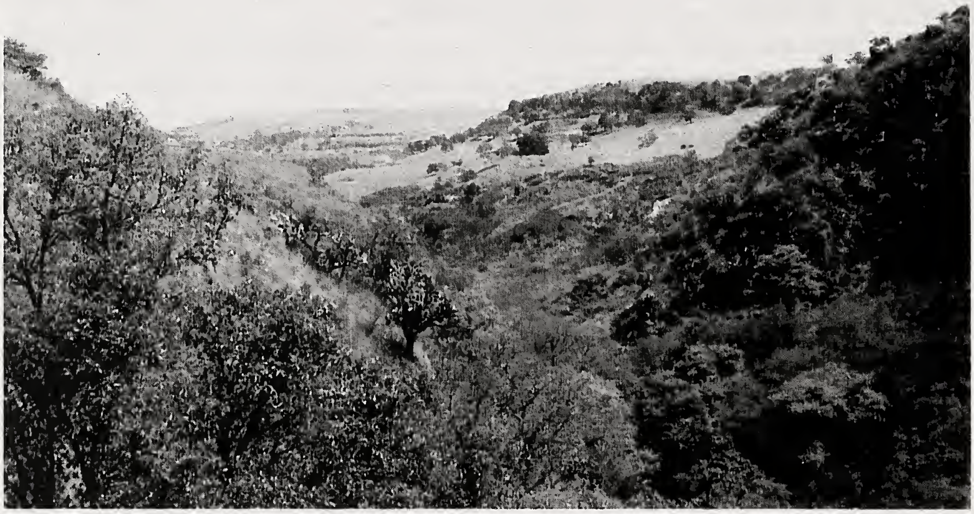

Figure 2. Characteristics of the zone where the specimen was found

Literature Cited.

Altamirano, T. A. Soriano, M. S. Torres, R. S.
2006. Anfibios y reptiles del Estado de México. Rev. Zool. 17:46-52).

Bryson Jr. R. W., Jennifer P., Frank T. B., Michael R. J. Forstner.
2007. A Phylogeny of the *L. mexicana* complex (Serpentes: Colubridae) based on mitocondrial DNA sequences suggest evidence for species-level polyphyly within *Lampropeltis*. Molecular Phylogenetics and Evolution 43:674-688.

Bryson Jr. R. W., Jennifer P., Frank T. B., Michael R. J. Forstner.
2007. A phylogeny of the L. mexicana complex (Serpentes: Colubridae) based on mitochondrial DNA sequences suggest evidence for species-level polyphyly within Lampropeltis. Molecular Phylogenetics and Evolution 43, 674-688.

Casas-Andreu and Pineda.
1997. Anfibios y reptiles: en Aguilera, y Monroy (Eds.) Lista taxonómica de los vertebrados terrestres del Estado de México. Colección Ciencias y Técnicas. UAEM

Camarillo, J. L.
1981. Distribución altitudinal de la herpetofauna comprendida entre Huitzilac, Estado de Morelos y La Ladrillera, Estado de México. Tesis de Licenciatura, UNAM. Campus Iztacala

Camarillo, J. L. and R. Aguliar.

1992. Noteworthy distributional records for some mexican amphibians and reptiles. Herpetology 22(1):5-6

Camarillo, J. L. and H. M. Smith.

1992. A handlist of the amphibians and reptiles of the State of Mexico, Greater Cinc. Herpetol. Soc. Contr. Herp:39-41

Campbel, J. A. and Lamar, W.W.

2004. The venomous reptiles of the western hemisphere. Comstock Publishing Associates. USA. Vol. II:870 pp.

Castillo, I. A. and D. M. Reyes-Armella.

2006. Listado y algunos aspectos ecológicos de la herpetofauna del Parque Estatal, Sierra de Tepotzotlán, Estado de México. Tesis de licenciatura, UNAM, FES Iztacala).

Dixon, J. R., M. Sababbath and R.Wortthington.

1962. Comments on snakes from central and western, Mexico. Herpetologica 18(2): 91-100

Flores-Villela, O. and Sherry

1994. Biodiversidad y conservación en México: vertebrados, vegetación y huso del suelo. 2da. ed. Edis. Técnico científicas, México

INEGI

1996. Carta Topográfica. Esc. 1:250.000.

Keer, K. G.

2003. Contribución a la herpetofauna del Municipio, Chapa de Mota, Estado de México. Tesis de licenciatura, UNAM, FES Iztacala

Lara-Gongora, G.

1983. Two new species of the lizard genus Sceloporus (Reptilia: Sauria: Iguanidae) from the Ajusco and Ocuilan sierras, Mexico. Bull. Mary. Herp. Soc. 19(1):1-14

Lemos-Espinal, J. and J. L. Rodríguez-Loeza

1984. Estudio general de la comunidad herpetofaunistica de un bosque templado (mezcla Quercus-Pinus) del Estado de México. Tesis de licenciatura. UNAM. Campus Iztacala

Manjarres, J.

1994. Anfibios del Estado de México. Bol. Acad. Reg. Inv. Flora y Fauna Cent. Sur de la Rep. Mexicana, 1(2):19-23

Manjarrez, J. C., C. Zepeda, R. Adaya and I. Salazar.

1995. Anfibios y reptiles de la Unidad de Monitoreo de la Biodiversidad de San Cayetano, Estado de México. UNAM-SEDESOL.

Mendoza-Quijano F, Sol de Mayo, A. M. L., Víctor Hugo, R. R., Angélica, E.H., and Martin, R. M.
2001. Anfibios y reptiles de la Sierra de Guanajuato: cien años después. Anales del Instituto de Biología, Universidad Nacional Autónoma de México. Serie Zoología 72 (2):233-243.

Quintero-Días, G., G. Adame and J. Vázquez-Díaz.
2001. Herpetological Review 32(4).

Ramirez, A., E. Godínez and J. L. Camarillo.
1991. Some amphibians and reptiles from Cahuacan, Transfiguration y Villa del Carbon, State of Mexico, with general comments on their ecology. Bull. Mary. Herp. Soc. 27(4):171-188

Smith, H. M. and R. B. Smith.
1976. Synopsis of the herpetofauna of Mexico. Vol. III

Smith, H. M. and R. B. Smith.
1977. Synopsis of the herpetofauna of Mexico. Vol IV

Smith, H. M. and E. H. Tailor.
1945. An annotated checklist and key to the snakes of Mexico. Bull. U.S. Nat. Mus. 187:239.

Valdespino, T. C.
1998. Anfibios y reptiles de la Sierra del Carmen, Estado de México. Tesis de licenciatura. UNAM, Campus, Iztacala

Zarate, J. F.
2002. Uso de los recursos espaciales y temporales por una comunidad de anfibios y reptiles del municipio de Isidro Fábela, estado de México. Tesis de licenciatura, UNAM, FES Iztacala

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News and Notes:

Harris (2009) mentioned that the NHSM was in the process of gathering Species Accounts, for all of Maryland's amphibians and reptiles, to be placed on the NHSM/DNR Website and eventually be published as a hard copy. This issue of the Bulletin of the Maryland Herpetological Society, contains the second series of these accounts, placed in a forum for any corrections/additions etc. prior to actual publication. These accounts will be authored by many individuals and when this project is completed will be a valuable asset to both the amateur and professional alike.

I would like to thank Dr. John E. Cooper of the North Carolina State Museum of Natural Sciences for his diligent editing of the Species Accounts.

Please send all comments to Herb Harris either by USPS or e-mail (hsharris@juno.com).

Literature Cited

Harris, Herbert S., Jr.
2009. The past history of documenting the distributions of amphibisnd and reptiles in Maryland and the District of Columbia. Bull. Md. Herp. Soc. 45(1):14-16.

Herbert S. Harris, Jr., The Natural History Society of Maryland, P.O. Box 18750, Baltimore, Maryland 21206.

News and Notes:

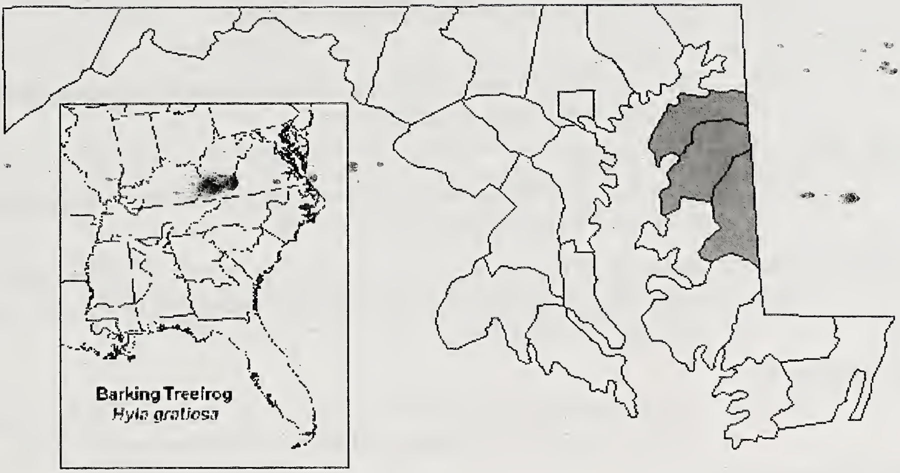
BARKING TREEFROG

Hyla gratiosa

The Barking Treefrog is Maryland's largest treefrog, and was also the last frog species to be discovered in the state. In 1982, a Barking Treefrog was found in Caroline County, [Maryland] and additional populations have subsequently been located in nearby regions of Maryland and Delaware. Adults reach a length of 2 to 2 ¾ inches (5.1 to 7.0 cm). The large stout body changes color from dark brown to bright green to pale gray and yellow with numerous dark spots on the back that are evident in all color variations. The skin is rather rough compared to that of the Green Treefrog. A light colored stripe may be present along the sides and the belly is white to yellowish white. Males have green or yellow throats and are smaller than females.

Barking Treefrog (Bay County, Florida). Wayne G Hildebrand ©

Distribution: The range of the Barking Treefrog is disjunct. The main portion of the distribution is from coastal North Carolina south to Florida and west into Louisiana, and from Alabama north into Tennessee. Isolated populations occur in western Kentucky and Tennessee, eastern Virginia, Delaware, and in Kent, Queen Anne's, and Caroline counties, Maryland. A population occurred in extreme southern New Jersey but is now possibly extirpated.



Barking Treefrog distributional map

Breeding: The call of the Barking Treefrog is a doglike bark repeated at one to two second intervals, "doonk" or "toonk"(**add link to call**). The common name, Barking Treefrog, is in reference to this call. The species breeds in Maryland from April through July. The male calls from the water to attract a female. The female deposits 500 to 2,000 eggs in clusters or singly attached to submerged vegetation. The eggs are about 0.04 to 0.07 inches (0.10 to 0.18 cm) in diameter and hatch after a few days. The dark brown tadpoles attain a length up to 2 ¾ inches (7.0 cm). The tadpole transform into froglets in about six to nine weeks with froglets measuring ½ to ¾ inches (1.4 to 2.0 cm).

Habitat: In Maryland, the primary habitats of the Barking Treefrog are Delmarva Bays. These wetlands are typically characterized as being fishless, woodland, vernal ponds. Barking Treefrogs are high climbers during warm moist weather, venturing to the tree tops. For the duration of cold or dry conditions they burrow underground or seek shelter in moist environments.

Status: The Barking Treefrog is common over much of its range. The scattered Maryland and Delaware populations, and the presumed extirpated New Jersey population, may now be what remain of a historically larger range. Since the Maryland populations are now at the periphery of the range, and the species requires a specialized habitat, the Maryland Department of Natural Resources categorizes them as "State Endangered"

References.

Anderson, K. and H.G. Dowling.
1982. Geographic Distribution: *Hyla gratiosa* (Barking Treefrog). Herpetological Review 13(4):130.

News and Notes:

Arndt, Rudolf G. and James F. White.
1988. *Hyla gratiosa*. Herpetological Review 19(1):16

Behler, John L. and F. Wayne King.
1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopf, Inc., New York.

Conant, Roger and Joseph T. Collins.
1998. A Field Guide to Reptiles and Amphibians Eastern and Central North America. Houghton Mifflin Co, Boston and New York:

Green, N. Bayard and Thomas K. Pauley.
1987. Amphibians and Reptiles in West Virginia. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

Harris, Herbert S.
1975. Distributional Survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society 11:73-167.

Hildebrand, Wayne G.
2005. Maryland's Anuran Populations: Are They at Risk from Anthropomorphic Impact. Bulletin of the Maryland Herpetological Society 41:121-201.

Hulse, Arthur C., C. J. McCoy, and Ellen J. Censky.
2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Ithaca, New York: Cornell University Press.

Mansueti, Romeo.
1941. A Descriptive Catalogue of the Amphibians and Reptiles Found in and Around Baltimore City, Maryland, Within a Radius of Twenty Miles. Proceedings of the Natural History Society of Maryland No. 7. Baltimore, Maryland: The Natural History Society of Maryland. p 53.

Martof, Bernard S., William M. Palmer, Joseph R. Bailey, and Julian R. Harrison III.
1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill, North Carolina: The University of North Carolina Press.

Mitchell, Joseph C. and John M. Anderson.
1994. Amphibians of Assateague and Chincoteague Islands. Martinsville, Virginia: Virginia Museum of Natural History Special Publication Number 2. p 120.

NatureServe.
2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 1, 2008).

Smithberger, Shannon I. and Christopher W. Swarth.
1993. Reptiles and Amphibians of the Jug Bay Wetlands Sanctuary. The Maryland Naturalist 37 (3-4): 28-46.

White, James F. Jr. and Amy Wendt White.
2002. Amphibians and Reptiles of Delmarva. Centreville, Maryland: Tidewater Publishers.

Wright, Albert Hazen and Anna Allen Wright.
1995. Handbook of Frogs and Toads of The United States and Canada. Ithaca, New York: Comstock Publishing Associates.

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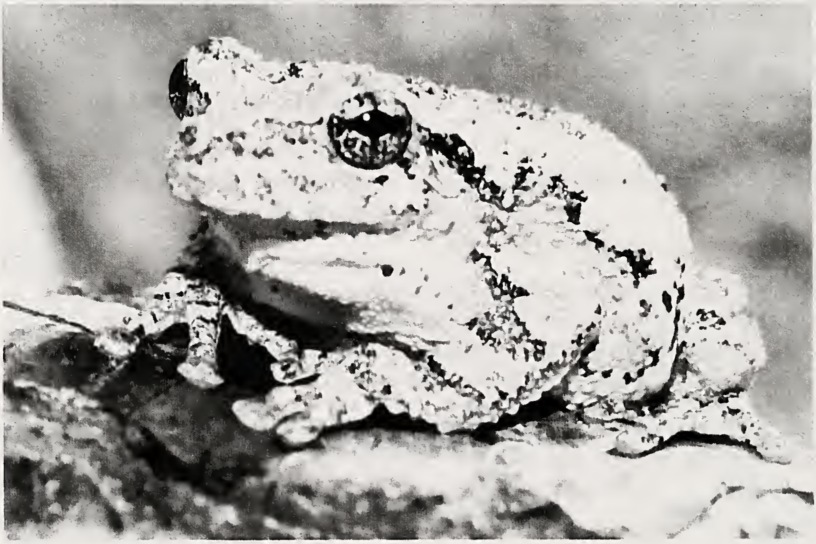
News and Notes:

GRAY TREEFROG

Cope's Gray Treefrog, *Hyla chrysoscelis,* and Common Gray Treefrog, *Hyla versicolor*

Cope's Gray Treefrog and the Common Gray Treefrog are cryptic species that have the same external appearance. The only way to accurately distinguish them is by examining their chromosomes. Cope's Gray Treefrog is diploid (has two copies of each chromosome) and the Common Gray Treefrog is tetraploid (has four copies of each chromosome). The two species usually do not interbreed and are reproductively isolated. However, natural hybridization between them occurs, resulting in triploid individuals. Gray Treefrogs reach a length of 1 ¼ to 2 3/8 inches (3.2 to 6.2 cm). The lichen or bark-like coloration of their rough skin is gray to brown to green, with dark mottling. This coloration may change due to ambient temperatures and activity levels. A light teardrop spot is located below each eye, and the [concealed] under surfaces of the hind legs are bright orange or golden yellow mottled with black. The belly surface is whitish. Males have dark throats and are slightly smaller than females.

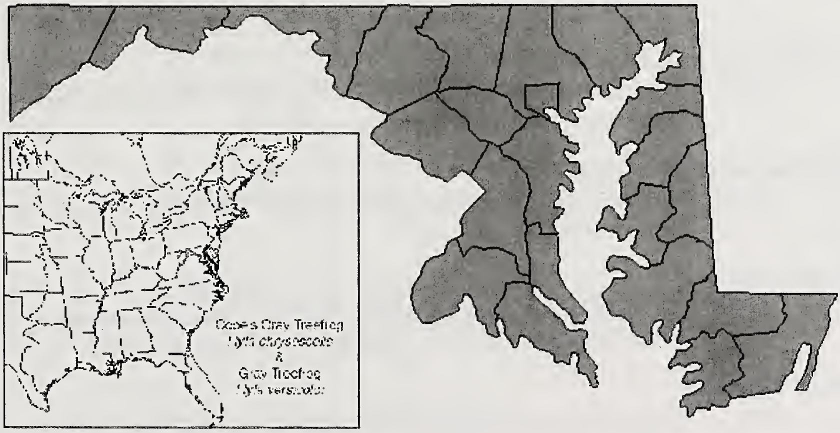


Cope's Gray Treefrog (Calvert County, Maryland). Wayne G Hildebrand ©

News and Notes:

Common Gray Treefrog (Frederick County, Maryland). Wayne G Hildebrand ©

Distribution: The range of Cope's Gray Treefrog is sympatric with that of the Common Gray Treefrog. Their combined ranges cover the eastern half of the United States, extending from Florida into southern Canada and west to central Texas and Minnesota, including all of Maryland. In Maryland, Cope's Gray Treefrog is more common on the lower Coastal Plain, making intrusions into the remainder of the state. The Common Gray Treefrog's range in Maryland is almost statewide, with the possible exception of sections of the lower Coastal Plain. There are areas in Maryland where both species occur at the same location, such as in the Blackwater National Wildlife Refuge or near Millersville.



Gray Treefrogs distribution map.

News and Notes:

Breeding: The breeding call of Cope's Gray Treefrog is a fast, high-pitched trill at rates of more than 36/s.(**add link to call**). The call is harsher and less musical than that of the Common Gray Treefrog, whose call is a relatively slower musical trill at about 25/s.(**add link to call**). Lower temperature causes the call of Cope's Gray Treefrog to slow and drop in pitch. The call may then sound like that of the Common Gray Treefrog, making positive identification difficult unless both species are calling at the same location and time. Both species call from low vegetation or from the ground, and both begin breeding in Maryland in March when the males migrate to the breeding locations. Breeding calls continue through the summer. Female Gray Treefrogs lay small groups of eggs, typically 10 to 40, in a thin film at the waters surface or attached to aquatic vegetation. The total number of eggs laid per female is up to 2,000. The eggs of the Gray Treefrogs measure about 0.05 inches (0.12 cm) and hatch in about two to five days. Tadpoles attain a length of approximately 2 inches (5.0 cm), and this stage lasts 45 to 65 days. Gray Treefrog tadpoles typically are gold colored with reddish tails. Newly transformed frogs measure ½ to ¾ inches (1.3 to 2.0 cm) and are green to gray in coloration with a white spot under the eye.

Habitat: The decidedly arboreal Gray Treefrogs inhabit the woodlands surrounding vernal wetlands (White and White 2002). They are often encountered on warm spring and early summer nights crossing roads migrating to breeding ponds. Being highly arboreal, the only time they are commonly found on the ground is during the breeding season, but they are sometimes seen on the sides of buildings at night.

Status: The two species of Gray Treefrog are common over their entire distributional ranges. In Maryland, both species appear to be quite common, but they are more likely to be heard than seen.

References.

Behler, John L. and F. Wayne King.
1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. New York: Alfred A. Knopf, Inc.

Conant, Roger and Joseph T. Collins.
1998. A Field Guide to Reptiles and Amphibians Eastern and Central North America. Boston and New York: Houghton Mifflin Co.

Green, N. Bayard and Thomas K. Pauley.
1987. Amphibians and Reptiles in West Virginia. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

Harris, Herbert S.
1975. Distributional Survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society. 11: 73-167.

Hildebrand, Wayne G.
2005. Maryland's Anuran Populations: Are They at Risk from Anthropomorphic Impact. Bulletin of the Maryland Herpetological Society. 41: 121-201.

Hulse, Arthur C., C. J. McCoy, and Ellen J. Censky.
2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Ithaca, New York: Cornell University Press.

Mansueti, Romeo.
1941. A Descriptive Catalogue of the Amphibians and Reptiles Found in and Around Baltimore City, Maryland, Within a Radius of Twenty Miles. Proceedings of the Natural History Society of Maryland No. 7. Baltimore, Maryland: The Natural History Society of Maryland. p 53.

Martof, Bernard S., William M. Palmer, Joseph R. Bailey, and Julian R. Harrison III.
1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill, North Carolina: The University of North Carolina Press.

Mitchell, Joseph C. and John M. Anderson.
1994. Amphibians of Assateague and Chincoteague Islands. Martinsville, Virginia: Virginia Museum of Natural History Special Publication Number 2. p 120.

NatureServe.
2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 1, 2008).

Ptacek, Margaret B., H. Carl Gerhardt, and Richard D. Sage.
1994. Speciation by Polyploidy in Treefrogs: Multiple Origins of the Tetraploid, *Hyla versicolor*. Evolution 43(30): 898-908.

Smithberger, Shannon I. and Christopher W. Swarth.
1993. Reptiles and Amphibians of the Jug Bay Wetlands Sanctuary. The Maryland Naturalist 37 (3-4): 28-46.

White, James F. Jr. and Amy Wendt White.
2002. Amphibians and Reptiles of Delmarva. Centreville, Maryland: Tidewater Publishers.

Wright, Albert Hazen and Anna Allen Wright.
1995. Handbook of Frogs and Toads of The United States and Canada. Ithaca, New York: Comstock Publishing Associates.

Zweifel, R. G.
1970. Distribution and Mating call of the Treefrog, *Hyla chrysoscelis*, at the Northeastern Edge of its Range. Chesapeake Science 11(2): 94-97.

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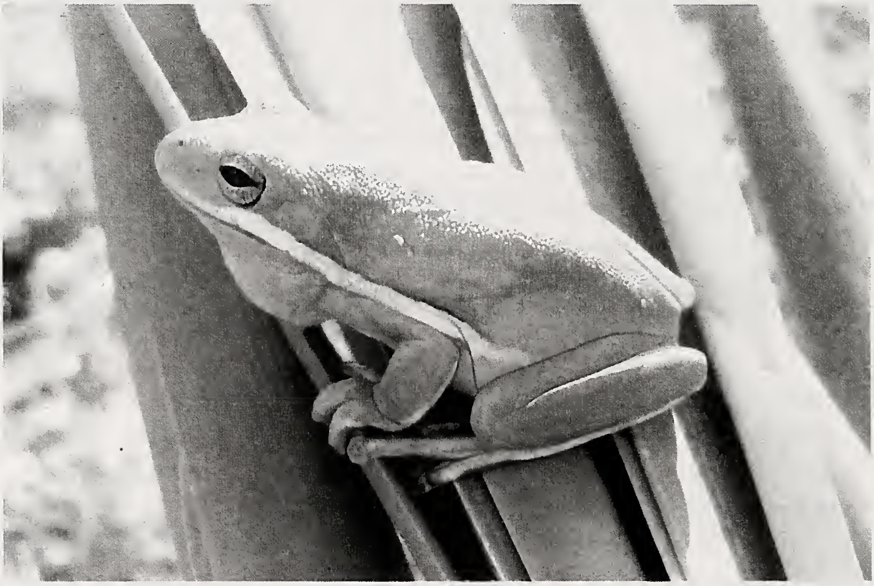
News and Notes:

GREEN TREEFROG

Hyla cinerea

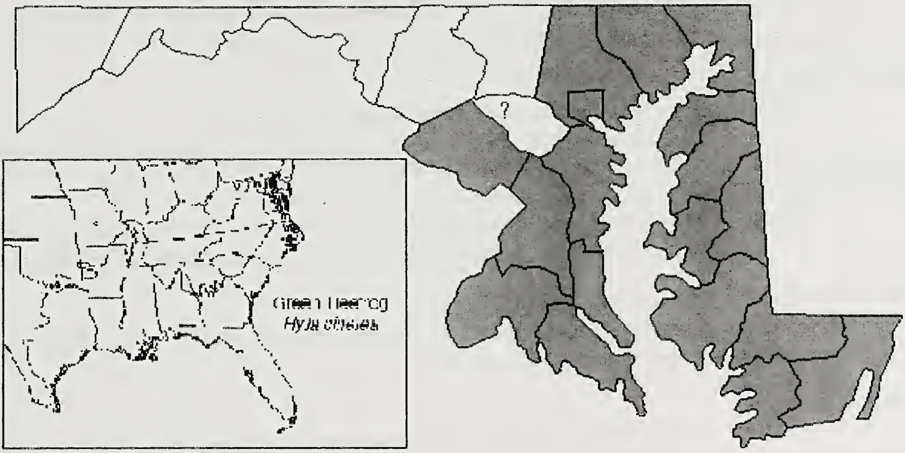
The Green Treefrog measures 1 ¼ to 2 ½ inches (3.2 to 6.4 cm) long. Its body color is typically bright green, but may be yellow to gray or dull green. The coloration changes with activity levels and ambient temperatures. The skin is relatively smooth. A white to yellow stripe runs along the upper lip, down the sides, and may reach the groin. The stripe is sometimes absent. Some specimens [may] have small golden spots on their backs. The belly is white and the undersides of the legs white to yellow. There is no apparent sexual dimorphism except for the male's vocal sac



Green Treefrog (Calvert County, Maryland). Wayne G Hildebrand ©

Distribution: The Green Treefrog's distribution extends south from the Coastal plains of Delaware and Maryland to Florida, west to Central Texas, and north into Southern Illinois. In Maryland, the frog inhabits the Coastal Plain surrounding the Chesapeake Bay and the Potomac River. A report from Howard County is questionable because the habitat in the reported area is not typical for this frog.

News and Notes:



Green Treefrog distributional map

Breeding: The breeding call of the Green Treefrog is a nasal, ducklike quack repeated up to 75 times a minute ["queenk-queenk-queenk."](**add link to call**). In Maryland, it breeds from March through July. The males call from emergent vegetation, such as cattails, reeds, trees, and grasses, to attract females. Females lay approximately 200 to 2,000 eggs in small clumps, which may be free floating or attached to vegetation. The eggs measure 0.03 to 0.06 inches (0.08 to 0.16 cm) and hatch in about seven days. The tadpole develops quickly, requiring only about four to nine weeks for metamorphosis. It is green and measures up to 1 ½ inches (4.0 cm) in length. Recently transformed frogs measure ½ to 2/3 inches (1.2 to 1.7 cm).

Habitat: The Green Treefrog inhabits swamps, tidal marshes, and borders of lakes, streams, and rivers that are typically heavily vegetated with reeds and cattails. It is quite common in man-made impoundments such as those found at Blackwater Wildlife Refuge. Unlike most frogs, they readily enter [into] brackish waters. Green Treefrogs are often seen on houses, feeding on insects attracted to lights.

Status: The Green Treefrog is common over its entire distribution including its range in Maryland. In some areas of Maryland's Coastal Plain, such as the Blackwater Wildlife Refuge, choruses of Green Treefrogs are so large that their calls produce a deafening roar that drowns out all other sounds.

References.

Behler, John L. and F. Wayne King.
1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. Alfred A. Knopf, Inc., New York.

Conant, Roger and Joseph T. Collins.
1998. A Field Guide to Reptiles and Amphibians Eastern and Central North America. Boston and New York: Houghton Mifflin Co.

Green, N. Bayard and Thomas K. Pauley.
1987. Amphibians and Reptiles in West Virginia. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

Harris, Herbert S.
1975. Distributional Survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society. 11: 73-167.

Hildebrand, Wayne G.
2005. Maryland's Anuran populations: Are they at risk from anthropomorphic Impact? Bulletin of the Maryland Herpetological Society. 41:121-201.

Hulse, Arthur C., C. J. McCoy, and Ellen J. Censky.
2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Ithaca, New York: Cornell University Press.

Mansueti, Romeo.
1941. A Descriptive Catalogue of the Amphibians and Reptiles Found in and Around Baltimore City, Maryland, Within a Radius of Twenty Miles. Proceedings of the Natural History Society of Maryland No. 7. Baltimore, Maryland: The Natural History Society of Maryland. p 53.

Martof, Bernard S., William M. Palmer, Joseph R. Bailey, and Julian R. Harrison III.
1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill, North Carolina: The University of North Carolina Press.

Mitchell, Joseph C. and John M. Anderson.
1994. Amphibians of Assateague and Chincoteague Islands. Martinsville, Virginia: Virginia Museum of Natural History Special Publication Number 2. p 120.

NatureServe.
2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 1, 2008).

Reed, Clyde F.
1956. *Hyla cinerea* in Maryland, Delaware, and Virginia, with notes on the taxonomic status of *Hyla cinerea evittata*. Journal of the Washington Academy of Sciences 46(10):328-332.

Reed, Clyde F.
1960. New Records for *Hyla cinerea* in Maryland, Delaware, Virginia and North Carolina. Herpetologica 16: 119-120.

Smithberger, Shannon I. and Christopher W. Swarth.
1993. Reptiles and Amphibians of the Jug Bay Wetlands Sanctuary. The Maryland Naturalist 37 (3-4): 28-46.

White, James F. Jr. and Amy Wendt White.
2002. Amphibians and Reptiles of Delmarva. Centreville, Maryland: Tidewater Publishers.

Wright, Albert Hazen and Anna Allen Wright.
1995. Handbook of Frogs and Toads of The United States and Canada. Ithaca, New York: Comstock Publishing Associates.

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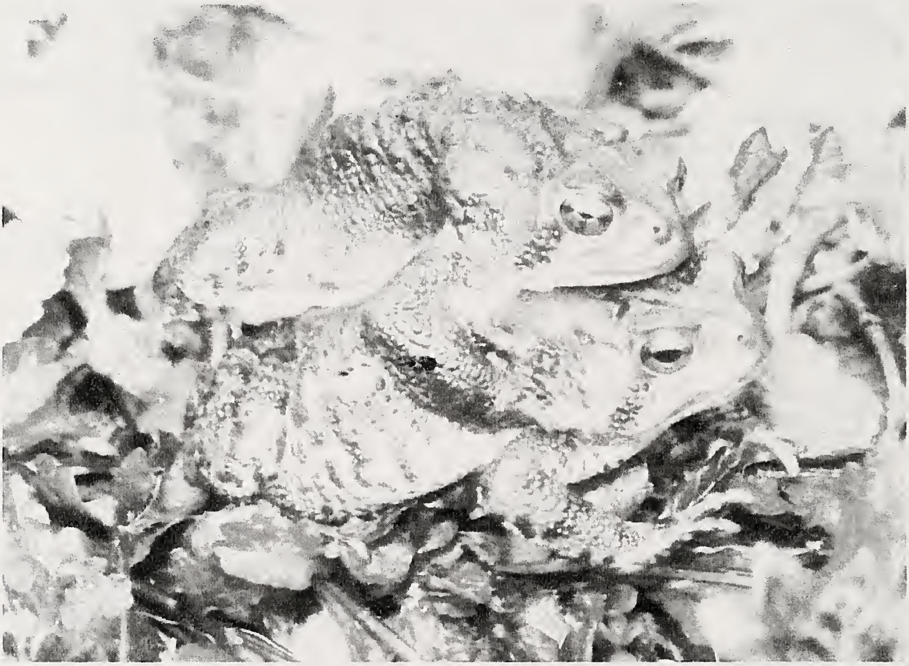
News and Notes:

AMERICAN TOAD

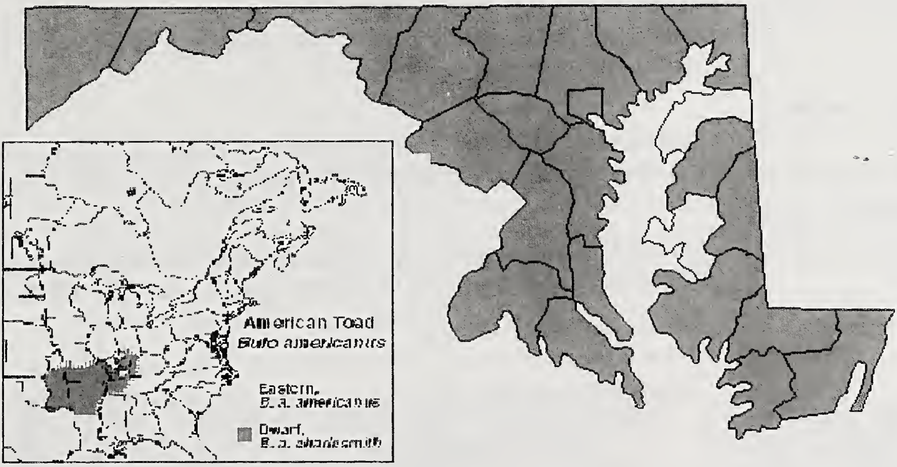
Anaxyrus americanus

The American Toad attains an adult length of 2 to 4 3/8 inches (5.1 to 11.2 cm). The body coloration is brown to gray, olive, brick red, or gold with a rough and warty skin texture. Brown and black spots are present on the back with one to two yellow, orange, red, or brown warts per spot. A light dorsal stripe may be present. The chest and abdomen typically are white with dark spots occurring mostly on the chest. A distinctive characteristic of the American Toad is that the parotoid gland on the top of its head is either separate from the eye ridge or connected by a spur. Males have dark throats and are typically smaller than females.



American Toads (from Frederick County, Maryland) in amplexus, male top, female bottom. Wayne G Hildebrand ©

Distribution: The American Toad can be found from Southern Canada south to Central Georgia, Alabama, Mississippi, and adjoining Louisiana. The range extends west to Kansas, and the Dakotas. The American Toad is absent from southern New Jersey and central Delmarva. American Toads are located state wide in Maryland except for the central Eastern Shore where they may be absent or occur in very small numbers.



American Toad distributional map

Breeding: The breeding call of the American Toad is a long, high pitched, musical trill lasting from 6-30 s(**add link to call**). The duration of the call makes it difficult to tell the number of toads vocalizing. A single external vocal sac generates the call. American Toads breed in Maryland from March through July. Warm rains trigger males calls from shallow water to attract a mate. Long double stranded egg masses are laid in shallow temporary wetlands or the margins of permanent ponds. Roadside ditches, mud puddles, and flooded fields are ideal breeding spots. The egg strands may contain 4,000 to 8,000 eggs. An egg measures 0.04 to 0.06 inches (0.10 to 0.14 cm) in diameter. Hatching occurs at about two to twelve days depending on temperature. The black tadpoles grow to 1 1/8 inches (3.0 cm) in length before changing into juvenile toads. Transformation takes about 28 to 65 days and the newly metamorphosed toads measure ¼ to ½ inch (0.7 to 1.2 cm). Males and females can breed after their first year.

Habitat: American Toads are common from back yards to the backwoods wilderness. They can be found in agricultural fields, gardens, meadows, and forests. Occasionally they may enter brackish habitats. The preferred habitat is usually near shallow water and moist hiding places. On rainy, warm nights in spring toads may be encountered crossing roads near breeding ponds. During the day they toad seek shelter in moist refuges such as under logs or in garden mulch. After breeding, the toads spread out in the surrounding habitat, venturing away from the water.

Status: The American Toad is common in Maryland and throughout its entire range. Being habitat generalists, they may be one of the most encountered species of frogs.

References.

Behler, John L. and F. Wayne King.
1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. New York: Alfred A. Knopf, Inc.

Conant, Roger and Joseph T. Collins.
1998. A Field Guide to Reptiles and Amphibians Eastern and Central North America. Boston and New York: Houghton Mifflin Co.

Green, N. Bayard and Thomas K. Pauley.
1987. Amphibians and Reptiles in West Virginia. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

Harris, Herbert S.
1975. Distributional Survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society. 11: 73-167.

Hildebrand, Wayne G.
2005. Maryland's Anuran Populations: Are They at Risk from Anthropomorphic Impact. Bulletin of the Maryland Herpetological Society. 41: 121-201.

Hulse, Arthur C., C. J. McCoy, and Ellen J. Censky.
2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Ithaca, New York: Cornell University Press.

Mansueti, Romeo.
1941. A Descriptive Catalogue of the Amphibians and Reptiles Found in and Around Baltimore City, Maryland, Within a Radius of Twenty Miles. Proceedings of the Natural History Society of Maryland No. 7. Baltimore, Maryland: The Natural History Society of Maryland. p 53.

Martof, Bernard S., William M. Palmer, Joseph R. Bailey, and Julian R. Harrison III.
1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill, North Carolina: The University of North Carolina Press.

Mitchell, Joseph C. and John M. Anderson.
1994. Amphibians of Assateague and Chincoteague Islands. Martinsville, Virginia: Virginia Museum of Natural History Special Publication Number 2. p 120.

NatureServe.
2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 1, 2008).

Smithberger, Shannon I. and Christopher W. Swarth.
1993. Reptiles and Amphibians of the Jug Bay Wetlands Sanctuary. The Maryland Naturalist 37 (3-4): 28-46.

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2002. Amphibians and Reptiles of Delmarva. Centreville, Maryland: Tidewater Publishers.

Wright, Albert Hazen and Anna Allen Wright.
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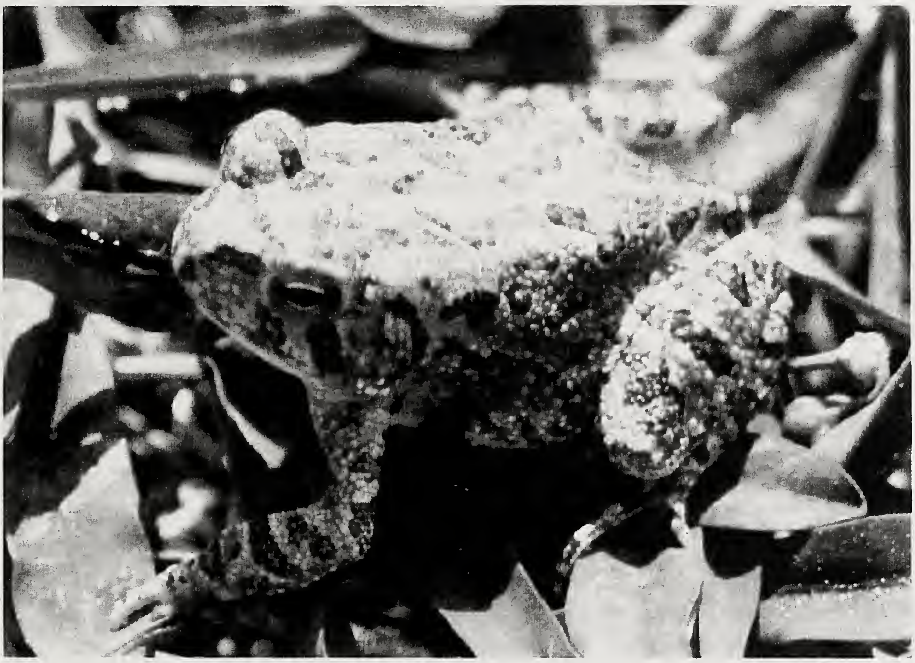
News and Notes:

FOWLER'S TOAD

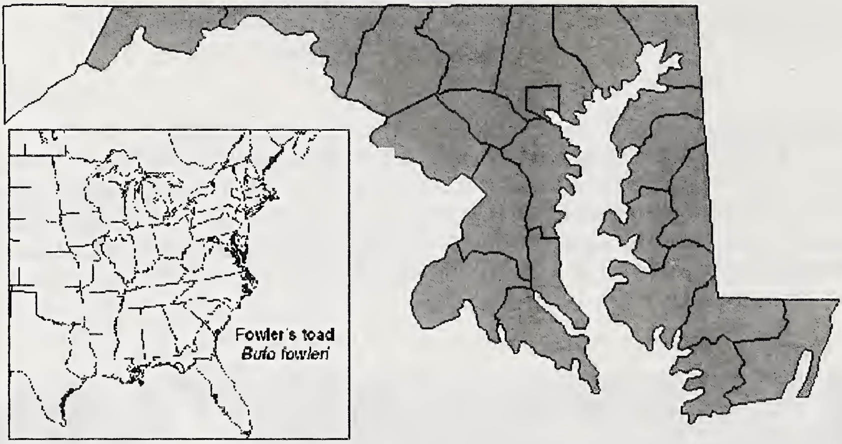
Anaxyrus fowleri

Fowler's Toad attains a body length of 2 to 3 ¾ inches (5.1 to 9.7 cm). The body color varies from brown to gray and is sometimes greenish or brick red. The skin is rough in texture and a narrow light stripe characteristically runs down the back. Dark spots on the back have three or more warts. The belly and chest are virtually unspotted. Unlike the American Toad, the parotoid gland touches the eye ridges of the Fowler's Toad. During the breeding season males have dark throats. Females are typically larger than males.



Fowler's Toad (specimen from Worcester County, Maryland). Wayne G Hildebrand ©

Distribution: Fowler's Toad ranges from central New England and the Great Lake's region south to the panhandle of Florida. The distribution continues west to Eastern Texas and Okalahoma. Fowler's Toads are distributed throughout Maryland, except for Garrett County.



Fowler's Toad distributional map.

Breeding: The breeding call of the Fowler's Toad is a nasal bleat lasting 1-4 s. The sound is likened to an extended sheep-like bleat, "w-a-a-h" (**add link to call**). Males call from the shallow edges of breeding pools. A single vocal sac produces the call. The breeding period for Fowler's Toad in Maryland runs from March through August. Double stranded egg masses, containing up to 8,000 eggs, are laid in shallow fresh water attached to aquatic vegetation. . An egg is about 0.04 to 0.06 inches (0.10 to 0.14 cm) in diameter and hatches after two to seven days. The black tadpoles attain a length of about 1 inch (2.7 cm) before transformation at about 21 to 60 days. A newly metamorphosed toad measures 1/3 to 2/3 inches (0.75 to 1.5 cm). Both the male and female attain reproductive maturation at greater than one year

Habitat: Fowler's Toads occurs mainly in sandy areas near shores of lakes, beach dunes, woodlands, fields, and in river valleys. They are common around gardens and outdoor lighting where they feed on attracted insects. Fowler's Toads may venture into brackish water marshes

Status: The Fowler's Toad is common on Maryland's Coastal Plain, less abundant to the west, and absent from Garrett County. Being a habitat generalist and adaptable to human development, it is common throughout its entire distribution

References.

Behler, John L. and F. Wayne King.
1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. New York: Alfred A. Knopf, Inc.

Conant, Roger and Joseph T. Collins.
1998. A Field Guide to Reptiles and Amphibians Eastern and Central North America. Boston and New York: Houghton Mifflin Co.

Green, N. Bayard and Thomas K. Pauley.
1987. Amphibians and Reptiles in West Virginia. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

Harris, Herbert S.
1975. Distributional Survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society. 11: 73-167.

Hildebrand, Wayne G.
2005. Maryland's Anuran Populations: Are They at Risk from Anthropomorphic Impact. Bulletin of the Maryland Herpetological Society. 41: 121-201.

Hulse, Arthur C., C. J. McCoy, and Ellen J. Censky.
2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Ithaca, New York: Cornell University Press.

Mansueti, Romeo.
1941. A Descriptive Catalogue of the Amphibians and Reptiles Found in and Around Baltimore City, Maryland, Within a Radius of Twenty Miles. Proceedings of the Natural History Society of Maryland No. 7. Baltimore, Maryland: The Natural History Society of Maryland. p 53.

Martof, Bernard S., William M. Palmer, Joseph R. Bailey, and Julian R. Harrison III.
1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill, North Carolina: The University of North Carolina Press.

Mitchell, Joseph C. and John M. Anderson.
1994. Amphibians of Assateague and Chincoteague Islands. Martinsville, Virginia: Virginia Museum of Natural History Special Publication Number 2. p 120.

NatureServe.
2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 1, 2008).

Smithberger, Shannon I. and Christopher W. Swarth.
1993. Reptiles and Amphibians of the Jug Bay Wetlands Sanctuary. The Maryland Naturalist 37 (3-4): 28-46.

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2002. Amphibians and Reptiles of Delmarva. Centreville, Maryland: Tidewater Publishers.

Wright, Albert Hazen and Anna Allen Wright.
1995. Handbook of Frogs and Toads of The United States and Canada. Ithaca, New York: Comstock Publishing Associates.

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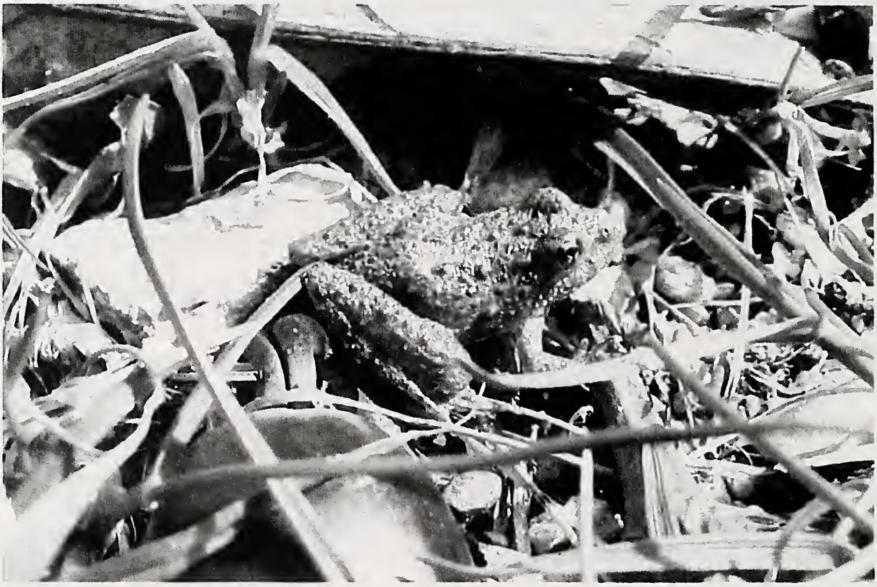
News and Notes:

NORTHERN CRICKET FROG

Acris crepitans

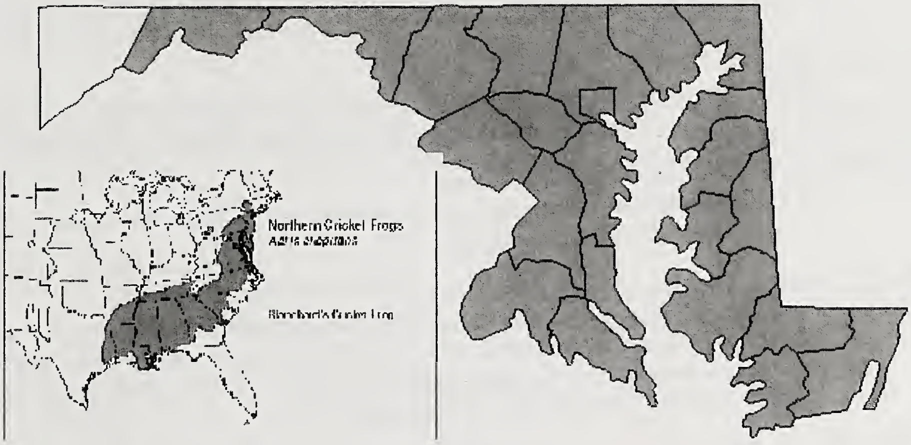
The Northern Cricket Frog is a small, non-climbing treefrog and is Maryland's smallest frog achieving a length of 2/3 to 1 ½ inches (1.6 to 3.8 cm). The body color varies from black, yellow-orange, or red on a base of green or brown. The skin is rough and warty and the belly is white to yellow. A dark triangle spot between the eyes and dark stripes on the back of the thighs are always visible. The hind leg when extended does not reach the snout. The hind feet are greatly webbed. Male Northern Cricket Frogs are slightly smaller than females and have a dark yellow vocal sac.



Northern Cricket Frog (specimen from Frederick County, Maryland) Wayne G Hildebrand ©

Distribution: The Northern Cricket Frog can be found from Southern New York south to the Gulf Coast of Florida. The range extends west to Eastern Texas. The range is most of Maryland with exception of Garrett County in the Allegheny Plateau.

Breeding: The breeding call of the male Northern Cricket Frog is a clicking noise like that of a cricket or the sound made when hitting two marbles together, "gick, gick, gick, gick, etc."(**add link to call**). The call is slow but speeds as it continues for twenty to thirty beats. A single vocal sac produces the call. They frequently are heard calling during the day. The Northern Cricket Frog breeds from March through July in Maryland Males call from the edge of permanent water sources such as ponds and lakes. Small clutches of eggs or single eggs are attached to submerged vegetation or strewn about the bottom of the pond. A female may laid about 250 eggs. The egg



Northern Cricket Frog distributional map

of measures about 0.09 to 0.2 inches (0.23 to 0.5 cm in diameter) and hatch in about seven days. Transformation from tadpole to frog takes 40 to 90 days. The tadpole, with its characteristic black tipped tail, attains a length of 1 1/8 to 2 inches (3.0 to 5.0 cm). A newly transformed frog measures 3/8 to 5/8 inches (01.0 to 1.5 cm). Sexual maturation occurs at about one year for both sexes of Northern Cricket Frogs.

Habitat: Northern Cricket Frogs are never far from water that has abundant shoreline and emergent vegetation that can be used for. Wetlands such as Delmarva Bays, ponds, ditches, swamps, or slow moving streams are preferred. They may also be located in brackish water marshes. Their habitat is typically near major river systems such as the Potomac, Susquehanna, or Patuxent Rivers in Maryland.

Status: The Northern Cricket Frog is common over their entire range. In Maryland they are a common species. Because of their habitat preferences they may have locally heavy populations and be missing from adjoining areas.

References.

Behler, John L. and F. Wayne King.
1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. New York: Alfred A. Knopf, Inc.

Conant, Roger and Joseph T. Collins.
1998. A Field Guide to Reptiles and Amphibians Eastern and Central North America. Boston and New York: Houghton Mifflin Co.

Green, N. Bayard and Thomas K. Pauley.
1987. Amphibians and Reptiles in West Virginia. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

News and Notes:

Harris, Herbert S.
1975. Distributional Survey (Amphibia/Reptilia): Maryland and the District of Columbia. Bulletin of the Maryland Herpetological Society. 11: 73-167.

Hildebrand, Wayne G.
2005. Maryland's Anuran Populations: Are They at Risk from Anthropomorphic Impact. Bulletin of the Maryland Herpetological Society. 41: 121-201.

Hulse, Arthur C., C. J. McCoy, and Ellen J. Censky.
2001. Amphibians and Reptiles of Pennsylvania and the Northeast. Ithaca, New York: Cornell University Press.

Mansueti, Romeo.
1941. A Descriptive Catalogue of the Amphibians and Reptiles Found in and Around Baltimore City, Maryland, Within a Radius of Twenty Miles. Proceedings of the Natural History Society of Maryland No. 7. Baltimore, Maryland: The Natural History Society of Maryland. p 53.

Martof, Bernard S., William M. Palmer, Joseph R. Bailey, and Julian R. Harrison III.
1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill, North Carolina: The University of North Carolina Press.

Mitchell, Joseph C. and John M. Anderson.
1994. Amphibians of Assateague and Chincoteague Islands. Martinsville, Virginia: Virginia Museum of Natural History Special Publication Number 2. p 120.

NatureServe.
2008. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 1, 2008).

Smithberger, Shannon I. and Christopher W. Swarth.
1993. Reptiles and Amphibians of the Jug Bay Wetlands Sanctuary. The Maryland Naturalist 37 (3-4): 28-46.

White, James F. Jr. and Amy Wendt White.
2002. Amphibians and Reptiles of Delmarva. Centreville, Maryland: Tidewater Publishers.

Wright, Albert Hazen and Anna Allen Wright.
1995. Handbook of Frogs and Toads of The United States and Canada. Ithaca, New York: Comstock Publishing Associates.

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News and Notes:

Editor's Note:

In: Harris and Crocetti. 2008. The Eastern Spadefoot Toad, Scaphiopus holbrookii in Maryland. Bull. Md. Herp. Soc. 44(3):107-110, we inadvertently sent an earlier draft to the type setter, leaving out a record for the spadefoot in Queen Anne's County and the following reference...

White, J.F. and A.W.White.
2002. Amphibians and reptiles of Delmarva. Delaware Nature Society, Inc., Tidewater Publishers, Centreville, MD. xvi + 248 pp.

News and Notes:

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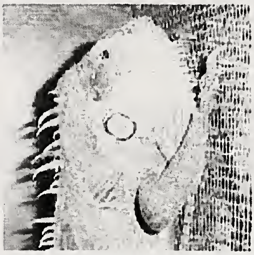

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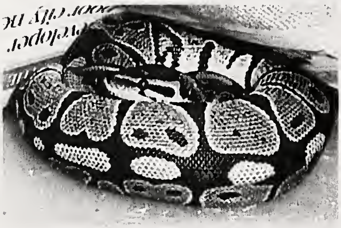

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